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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,762	08/03/2001	Takashi Kitaguchi	212135US2	5946

22850 7590 04/09/2007  
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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STOCK JR, GORDON J

ART UNIT	PAPER NUMBER
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2877

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/09/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/09/2007.

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## Office Action Summary

**Application No.**

09/920,762

**Applicant(s)**

KITAGUCHI ET AL.

**Examiner**

Gordon J. Stock

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-12, 16-18, 20 and 27-34 is/are rejected.
- 7) ☒ Claim(s) 1-9, 13-15 and 21-26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 21, 2006 has been entered.

### *Claim Objections*

2. **Claims 1-34** are objected to for the following: in **claims 1, 5, 7, 10, 13, and 15**, the phrase 'the gravity detected by a sensor, a rotation component of the position information' should read -the gravity direction by a sensor, a rotation component of position information-. As for claim 16 'the position information' of line 9 lacks antecedent basis. Examiner suggests 'position information' solely. As for **claim 20**, 'the light' and 'the predetermined' of line 7; 'the plurality of position information' and 'the respective positions' of line 10 lack antecedent basis. Examiner suggests using 'light;' 'a predetermined pattern,' 'a plurality of position information;' and 'respective positions.' **Claims 2-4, 6, 8, 9, 11, 12, 14, 16-19, 21-34** are objected to for depending from an objected base claim.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. **Claims 27-34** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claims 27-34** recite the limitations 'the expressing d)' and 'the program causing the computer to express' respectively. There is insufficient antecedent basis for these limitations in the claims.

***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. **Claims 16-18, 20**, are directed to a judicial exception; as such, pursuant to the Interim Guidelines on Patent Eligible Subject Matter (MPEP 2106), the claims must have either physical transformation and/or a useful, concrete and tangible result. The claims fail to include transformation from one physical state to another. Although, the claims appear useful and concrete, there does not appear to be a tangible result claimed. Merely, expressing said each point (the expressing step is an abstraction without a tangible result of **claims 16 and 20**) would not appear to be sufficient to constitute a tangible result, since the outcome of the expressing has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. As such, the subject matter of the claims is not patent eligible. **Claims 17-18** are rejected for depending from a rejected base claim. In addition, the further limiting of **claims 16 and 20** by **claims 17-18** does not appear to have a tangible result claimed.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 10, 12, 20, 33, 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kitaguchi et al. (6,038,074)**—previously cited by applicant in view of **Gu et al. (6,639,685)**—previously cited and **Iddan et al. (6,765,606)**—previously cited.

As for **claim 10**, Kitaguchi discloses the following: a picture taking part comprising one camera (Fig. 4: 1); a rotation component detecting part detecting based on a gravity direction and an angle around the gravity direction detected by a sensor, a rotation component of position information specifying a position to take a picture of the object by the picture taking part (Fig. 4: 3-6) and a storage part (col. 33, lines 60-65). As for a projecting part, Kitaguchi is silent. However, Gu discloses a projecting part for projecting a pattern for measuring contour (Fig. 1: 12) and Iddan in three dimension imaging system teaches using a projecting part with a line pattern for 3D imaging (Fig. 1: 22 and 30). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the system comprise a projecting part in order to calculate three dimensional coordinates of objects being imaged.

As for **claim 20, 33, 34**, Kitaguchi discloses the following: a computer with software for performing tasks (col. 30, lines 20-25); calculating a three-dimensional coordinate of each point of the object for each image based on at least two images and rotation components of the respective position of the single camera and calculating a translation component of position

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information based on three-dimensional coordinates for each point of the object calculated and the rotation component and expressing each point based on translation component; calculating rotation component applied for producing composed image based on respective attitude angles from which images are taken from different positions and finds corresponding points among images taken from different positions and calculates a translation component applied for producing a composed image (**claims 20, 33, 34**) (Fig. 4: 1, 3-8; Fig. 12; col. 26, lines 33-35; col. 27, lines 1-67). As for a projecting part (**claim 20**), Kitaguchi is silent. However, Gu discloses a projecting part for projecting a pattern for measuring contour (Fig. 1: 12) and Iddan in three dimension imaging system teaches using a projecting part with a line pattern for 3D imaging (Fig. 1: 22 and 30). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the system comprise a projecting part in order to calculate three dimensional coordinates of objects being imaged. As for using a plurality of cameras (**claim 20**), Kitaguchi is silent. However, Iddan in a three dimension imaging apparatus discloses using two cameras for three dimensional imaging through dual wavelength triangulation that is relatively simple and robust (col. 13, lines 5-25; col. 2, lines 35-45; col. 3, lines 34-50). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the system comprise two cameras in order to perform three dimensional imaging through dual wavelength triangulation.

As for **claim 12**, Kitaguchi in view of Gu and Iddan disclose everything as above (see **claim 10**). Kitaguchi does not disclose a three-dimensional image generating part generating a three-dimensional image of the object in accordance with coordinates of the object obtained by said three-dimensional coordinate calculating part and an image obtained when the light having

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the predetermined pattern is not applied to the object by said picture taking part. However, Gu discloses that four phase-shifted fringe patterns are used in the image analysis (col. 19, lines 25-30). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made that the system and method comprises and uses a three-dimensional image generating part generating a three-dimensional image of the object in accordance with coordinates of the object obtained by said three-dimensional coordinate calculating part and an image obtained when the light having the predetermined pattern is not applied to the object by said picture taking part such as three other phase patterns in order to generate a three dimensional image of the four different phase patterns.

9. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kitaguchi et al. (6,038,074)**—previously cited by applicant in view of **Gu et al. (6,639,685)**—previously cited and **Iddan et al. (6,765,606)**—previously cited further in view of **Hamada (6,369,899)**—previously cited.

As for **claim 11**, Kitaguchi in view of Gu and Iddan disclose everything as above (see **claim 10**). Kitaguchi does disclose a storage part (col. 33, lines 60-65). Kitaguchi is silent concerning an external control signal for a projecting part. However, Hamada in a camera with projector for selectively projecting pattern lights teaches a computer controls the projector system (Fig. 5: personal computer). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have the device have the projecting part be controlled by a control signal external in order to provide real-time control of the imaging system.

***Allowable Subject Matter***

10. **Claims 1-9, 13-15, 19, and 21-26** would be allowable if rewritten to overcome objections above as well as to include all limitations of the base claim.

**Claims 16-18** would be allowable if rewritten to overcome the rejection under 35 U.S.C. 101 above.

**Claims 27-32** would be allowable if rewritten to overcome rejection under 35 U.S.C. 112 second paragraph and 35 U.S.C. 101 above.

As to **claims 1, 5, 7**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a shape measurement system the particular three-dimensional shape composing part, in combination with the rest of the limitations of **claims 1-9, 21-26**.

As to **claims 13, 15, 16**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a shape measurement method and a medium for measuring a three-dimensional shape the particular calculating a translation component step, in combination with the rest of the limitations of **claims 13-19, 27-32**.

***Response to Arguments***

11. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: U.S. Patent 5,475,422 to Mori et al.

U.S. Patent 6,104,840 to Ejiri et al.

U.S. Patent 6,466,701 to Ejiri et al.



U.S. Patent 6,600,168 to Geng

***Fax/Telephone Numbers***

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

*Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (571) 273-8300*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 8:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

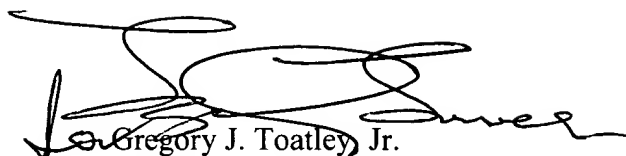
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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April 2, 2007



Gregory J. Toatley Jr.  
Supervisory Patent Examiner  
Art Unit 2877

**LAYLA G. LAUCHMAN**  
**PRIMARY EXAMINER**